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DEPARTMENTS.

SOLUTIONS OF PROBLEMS.

ARITHMETIC.

159. Proposed by F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy in Defiance College, Defiance, Ohio.

The amount of tax assessed on the property of a city is T,=\$145,850; and the treasurer was allowed a fee of $m\%$,=$\frac{3}{4}\%$, for collection. If $n\%$,=10%, of the tax was uncollectable, what were the net proceeds of the tax?

Solution by G. B. M. ZERR, A. M., Ph. D., The Temple College. Philadelphia, Pa., and J. R. HITT, Coronal Institute, San Marcos, Tex.

$$\text{Net proceeds}=T(100\%-m\%)(100\%-n\%)$$
$$=\$145,850\times.90\times.99\tfrac{1}{4}=\$130,280.51\tfrac{1}{4}.$$

If he was allowed $m\%=\frac{3}{4}\%$ of the whole, then net proceeds

$$=T(100\%-m\%-n\%)$$
$$=\$145,850\times.89\tfrac{1}{4}=\$130,171.12\tfrac{1}{2}.$$

160. Proposed by F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy in Defiance College, Defiance, Ohio.

A farm is rented for \$$R$,=\$300, in cash and a certain number of bushels of wheat. When wheat is \$$n$,=\$4-5 per bushel the rent is $p\%$,=$12\frac{1}{2}\%$ lower than when wheat is \$$m$, =\$1 1-5 per bushel. Find the number of bushels of wheat.

Solution by D. B. NORTHRUP, Mandana, N. Y.

Let x=the number of bushels of wheat. Then, by the conditions of the problem, $R+nx$=the number of dollars in the rent, when wheat is \$$n$ per bushel, and $R+mx$=the number of dollars in the rent when wheat is \$$m$ per bushel. But, also by the conditions of the problem, $R+nx=(1-p)(R+mx)$. Solving this equation for x, we find $x=\dfrac{pR}{(1-p)m-n}$. Substituting the numbers for the letters, $x=150$, the number of bushels of wheat.

ALGEBRA.

153. Proposed by JOHN M. COLAW, A. M., Monterey, Va.

Eliminate x, y, z, from the equations

$$x^2+yz=a,$$
$$y^2+zx=b,$$
$$z^2+xy=c,$$
$$x+y+z=0.$$

Solution by MARCUS BAKER, Washington, D C.

Let $s=a+b+c$; then